Anthonyite  Cu(OH, Cl)$_2$·3H$_2$O

Crystal Data:  Monoclinic.  Point Group:  2/m.  As prismatic crystals, commonly curved along [001], to 1 cm; as crusts.


Optical Class:  Biaxial (−).  Pleochroism:  X = rich lavender;  Y = Z = deep smoky blue.
Orientation:  Y = b;  Z ∧ b = 13°.  Absorption:  Y = Z > X.  α = 1.526  β = 1.602  γ = 1.602  2V(meas.) = 3°


X-ray Powder Pattern:  Centennial mine, Michigan, USA.  5.84 (10), 4.14 (7), 3.99 (6), 3.44 (6), 2.87 (6), 3.18 (4), 3.07 (4)

Chemistry:

<table>
<thead>
<tr>
<th>Element</th>
<th>Formula</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu</td>
<td>41.3</td>
<td></td>
</tr>
<tr>
<td>AgCl</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Cl</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>H$_2$O$^+$ + OH</td>
<td>35.5</td>
<td></td>
</tr>
<tr>
<td>H$_2$O$^+$</td>
<td>16.4</td>
<td></td>
</tr>
</tbody>
</table>

Total 99.74

(1) Centennial mine, Michigan, USA; Cu by electrolysis, H$_2$O:OH from charge balance, corresponding to Cu$_{1.00}$[(OH)$_{1.72}$Cl$_{0.28}$]$\Sigma=2.00$·2.80H$_2$O.

Occurrence:  In cavities and fractures in basalt, formed by the action of chlorine-bearing connate waters on copper (Centennial mine, Michigan, USA).

Association:  Tremolite, quartz, epidote, monazite, copper, cuprite, paratacamite (Centennial mine, Michigan, USA).


Name:  For Professor John Williams Anthony (1920–1992), American mineralogist, University of Arizona, Tucson, Arizona, USA.
